

REMARKS

Claims 1, 3, 6, 7, 9, 10 and 12-18 are all the claims pending in the application. Claims 1, 3, 6, 7, 9 and 12-18 are allowed. Claim 10 is amended herein.

I. Claim Rejection under 35 U.S.C. § 103

Claim 10 is rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Shinohara in view of Kado et al, and further in view of Okumura in view of Hampden-Smith.

Applicants note that Shinohara is a newly cited reference and is not listed on a PTO 892 Form. Thus, Applicants respectfully request the Examiner to provide a PTO 892 Form listing the cited reference with the next Official Communication.

The Examiner asserts that Shinohara discloses all elements of the claim except for the fluorescent layer covering the protection layer of the front-side glass substrate, wherein the fluorescent material comprises phosphor mono-crystal particles having a particle diameter of 10-200 nm and wherein the fluorescent layer is a film having a thickness of 0.05-0.5 μm .

In order to remedy these deficiencies, the Examiner relies on Kado for the disclosure of a plasma display panel wherein a fluorescent layer is formed in such a manner to cover the protection layer of the front-side glass substrate in order to increase the phosphor material surface area and increase brightness and enhance luminous efficiency of the plasma display. It is the Examiner's position that it would have been obvious to one of ordinary skill in the art to incorporate the phosphor layer distribution disclosed by Kado in the plasma display panel of Shinohara for the reasons discussed above.

The Examiner further relies on Okumura for the disclosure of a plasma display panel wherein a fluorescent layer comprises a fluorescent material made of particles each having a diameter of 10-200 nanometers and the fluorescent layer having a thickness of 0.3-0.5 micrometers in order to increase the brightness of the plasma display panel. The Examiner states that Okumura is silent as to the limitation of the particles being mono-crystal particles. To remedy this deficiency of Okumura, the Examiner relies on Hampden-Smith for the disclosure of a plasma display panel having a fluorescent layer comprised of single crystal particles having a diameter of 20-100 nanometers, which increase luminescent efficiency and brightness of the display panel. It is the Examiner's position that it would have been obvious to one of ordinary skill in the art to incorporate the mono-crystal phosphor particles disclosed by the combination of Okumura and Hampden-Smith in the plasma display of Okumura in order to further increase the luminescent efficiency and brightness of the plasma display panel.

Applicants respectfully traverse the rejection and submit that the cited references, whether taken alone or in combination, do not teach or suggest the claimed invention as set forth in claim 10, as amended, and therefore do not render the claimed invention obvious.

Claim 10 has a main feature of the fluorescent material comprising phosphor mono-crystal particles having a particle diameter of 10 or more nm and less than 25 nm and the fluorescent layer having a thickness of 0.05 or more micrometers and less than 0.3 micrometers whereby the phosphor particle can be utilized efficiently because the fluorescent layer has a film thickness almost equivalent to the depth by which the vacuum ultraviolet ray will penetrate into the fluorescent layer.

As indicated by the Examiner, Shinohara does not teach a fluorescent layer covering the protection layer of the front-side glass substrate, wherein the fluorescent material comprises phosphor mono-crystal particles having a particle diameter within the claimed range and wherein the fluorescent layer is a film having a thickness within the claimed range. Therefore, Shinohara does not teach anything more than the references previously cited. Kado et al does not remedy the deficiencies of Shinohara.

Okamura, in contrast to the presently claimed invention, discloses a plasma display panel wherein a fluorescent layer comprises a fluorescent material made of particles each having a diameter of 100-200 nanometers (column 4, lines 3-30) and the fluorescent layer having a thickness of 0.3-0.5 micrometers (column 7, lines 38-48) in order to increase the brightness of the plasma display panel, as indicated by the Examiner.

Hampden-Smith discloses a plasma display panel (column 35, lines 28-33) having a fluorescent layer comprised of single crystal particles having a diameter of 25-100 nanometers, the single crystal particles increase the luminescent efficiency and brightness of the display panel (column 38, lines 47-65), as indicated by the Examiner.

Neither Okamura nor Hampden-Smith teaches or suggests the claimed thickness of the fluorescent layer and the claimed diameter of phosphor mono-crystal particle, and therefore do not remedy the deficiencies of the combination of Shinohara and Kado et al.

Thus, one of ordinary skill in the art would not have been motivated to combine the references as suggested by the Examiner with a reasonable expectation of achieving the presently claimed invention.

Accordingly, Applicants respectfully request withdrawal of the rejection.

II. Allowable Subject Matter

On page 4 of the Office Action, claims 1, 3, 6, 7, 9 and 12-18 are allowed.

Applicants submit that claim 10 is allowable over the cited art for the reasons set forth above. Thus, all claims in the application are distinguished over the art.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Claims are all the claims pending in the application.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

AMENDMENT UNDER 37 C.F.R. §1.111
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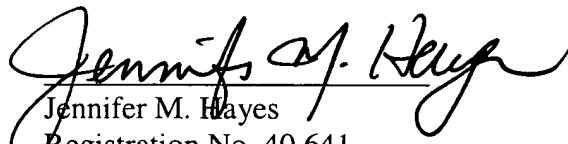
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